during prosecution of the instant application to deposit account 50-2134.

REMARKS

1. Claims 1-30 were previously pending. Claims 1-14 were withdrawn from consideration by the Examiner, as being drawn to a non-elected invention. Claims 15-30 were rejected by the Examiner in the Office Action dated October 24, 2002.

2. Claims 15-30 have been rejected under 35 U.S.C. 102(b).

Rejection of Claims 15-30 under 35 U.S.C.102 (b) Over Vadlamani et al., Walon, Kampen, DE 4428933, and Meuser et al.

3. The Examiner has rejected Claims 15-30 under 35 U.S.C. 102 (b) as being anticipated by Vadlamani *et al.*, Walon, Kampen, DE 4428933, and Meuser *et al.*

The Examiner alleges that Claims 15-30 are unpatentable over Vadlamani *et al.*, Walon, Kampen, DE 4428933, and Meuser *et al.* because "any one of said references discloses a aqueous slurried product containing separated (*i.e.* not agglomerated) starch granules and protein" (Paper No. 5, Page 2, Lines 17-18).

Applicant respectfully traverses the rejection. It is stated in the MPEP (MPEP 2131) that "[A] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference" and that

"[T]he identical invention must be shown in as complete detail as is contained in the ... claim."

The instant claims recite products made by the processes recited in Claims 1-14. Instant Claim 15 recites a product produced by the process of Claim 1, *i.e.*, a method for processing an amylaceous flour, said method comprising providing an aqueous slurry of an amylaceous flour comprising starch-protein and starch-starch agglomerates, subjecting said slurry to conditions of shear, cavitation and impact; and obtaining a slurry comprising deagglomerated starch granules and protein. The qualities and properties of the products and methods of the invention are set forth in the specification and in the examples. As disclosed in the instant specification, the "quality of the starch recovered from grains such as rice or some vegetables is determined by the amount of residual protein, by the relative absence of starch-starch and starch-protein agglomerates, and by a low percentage of starch damage" (Page 4, Lines 24-26). The product produced by the processes of the invention, *i.e.*, the resultant deagglomerated material, "is essentially individual, intact starch granules and protein homogeneously dispersed in a liquid matrix" (Page 5, Lines 15-17). Utilizing the methods of the invention, starch-protein agglomerates are deagglomerized with minimal starch damage (Page 10, Lines 11-17). The instant specification discloses that "if particle size reduction is incomplete or if the range of sizes of the particles does not appear to follow an essentially normal distribution pattern, then starch-protein agglomerates can remain in the starch fraction after centrifugation, thereby increasing the protein concentration of the starch. In such circumstances, despite any number of washings, the protein concentration of the starch fractions will not decrease to the level attained when all the deagglomerated protein is removed. To achieve complete separation from protein and thus obtain a pure starch product, it is extremely important that complete particle size reduction occurs. Further, because intact starch granules have more commercial value, damage to the starch granules must be minimized. The product resulting from the

deagglomeration procedure of the invention is essentially individual starch granules and protein in a liquid matrix (Paragraph bridging Pages 12-13).

Applicant respectfully disagrees with the Examiner's assertion that the prior art references (Vadlamani *et al.*, Walon, Kampen, DE 4428933, and Meuser *et al.*) anticipate the claimed invention. A careful reading of the prior art references and the instant specification indicate that the product of the invention is distinguishable from the products of the prior art references. As discussed above, the methods of making the products of the invention impart qualitative differences and characteristics onto the products of the invention. Vadlamani *et al.*, Walon, Kampen, DE 4428933, and Meuser *et al.* do not anticipate the invention because the products of Vadlamani *et al.*, Walon, Kampen, DE 4428933, and Meuser *et al.* are not the same as the products of the invention and are not equivalent to the products of the invention. In particular, subjecting an aqueous slurry of an amylaceous flour comprising starch-protein and starch-starch agglomerates to conditions of shear, cavitation and impact will result in a product of individual starch granules and protein homogeneously dispersed in a liquid matrix. The prior art references do not disclose, teach, exemplify, or recite said product or a process that will result in said product.

4. Vadlamani *et al.* teach in Example 1 "wheat flour was mixed slowly in a 4-quart Hobart mixer fitted with a cake paddle, while a solution was added containing water (34 ml), table salt (2 g), and a second salt... The ingredients for each batch were mixed 1 minute at speed 1 and 4 minutes at speed 2 on the Hobart mixer. After blending each ingredient batch, the crumbly dough was pressed into a 5.5 mm thick sheet... The **resultant thick dough piece** ..." Column 5, Lines 26 to 58, in particular. In Example 3, Vadlamani *et al.* teach "one hundred grams of the wheat flour described in Example 1 was blended in a 4 quart Hobart mixer while a solution of sodium and potassium

carbonates (0.9 and 0.1 g. respectively in 20 ml water) was added over a period of 20 seconds mixing at speed 1. ... was added over a period of 20 seconds during continued mixing at speed 1... An additional 20 seconds of speed 1 mixing then followed. At this point , mixing was continued for an additional 4 minutes at speed 2. A blank was also prepared in the same fashion. The alkaline noodle **doughs** with pH about 10.5 were formed and sheeted , and 200X200 mm samples of each raw dough sheet ... (Column 7, Lines 6 to 24, in particular). In Example 7, Vadlamani *et al.* teach that durum semolina was placed in a Hobart mixer fitted with a flat paddle agitator and that water was added over a two minute period to the semolina while the mixer was running at speed 1. "Thereafter, the mixer was run another 3 minutes at speed 2. The mixing bowl was covered with a damp cloth, and the **crumbly dough** was allowed to rest "(Column 9, Line 63 to Column 10, Line 3, in particular). In Example 11, Vadlamani *et al.* teach that "one hundred grams of water and 57.1 g of HRW wheat flour (water/flour=1.75 w/w) were mixed into a slurry at 25°C... The slurry was sheared at high-speed using an Ultra Turrax Mixer (Tekmar Company, Cincinnati, Ohio) at a speed setting of 75 for 3 minutes, with only slight warming of the mixture, and the pH of each slurry was measured. The highly sheared slurry was centrifuged at 1500 rpm (500 X g) for 5 minutes in a CU-5000 centrifuge (Damon/IEC division, Dunstable, Beds, UK) to separate the slurry into prime starch (bottom layer), branny material and tailing starch (middle layer), and protein concentrate (top layer). The protein concentrate phase was pored off, and was centrifuged again at 3000 rpm (10000 X g) for 10 minutes. Gluten became cohesive during this step, and the gluten mass was hand-washed until starch was no longer visible in the washings...Prime starch was rinsed with distilled water twice to remove the branny material, and the washings were discarded. Starch, washed out from the protein concentrate, was recovered by centrifugation (500 X g for 10 minutes) and was washed several times with fresh water. The combined prime starch and the starch from protein concentrate was dried in an oven at 45 °C " (Column 12, Line 50 to Column 13, Line 13, in particular). Thus, there is no disclosure in Vadlamani *et al.* indicating an aqueous slurry of an amylaceous flour comprising starch-protein and

starch-starch agglomerates, subjecting said slurry to conditions of shear, cavitation, and impact and obtaining a slurry comprising deagglomerated starch granules and protein. There is no disclosure, teaching, exemplification, or recitation of a process whereby a slurry is subjected to all three conditions: shear, cavitation, and impact or that the result is deagglomerization of the starch-protein agglomerates with minimal starch damage and the homogeneous dispersion of individual starch granules and protein in a liquid matrix. Thus, Vadlamani *et al.* do not anticipate the claimed invention.

5. Walon (U. S. Patent 4,217,414) teaches a process whereby a mixture of vital wheat gluten and starch is treated in aqueous suspension with a bacterial alpha-amylase under conditions whereby the starch is solubilized without gelatinizations. Soft wheat flour was suspended in water and the suspension sieved to eliminate some of the coarse fiber. The suspension was agitated to maintain the protein and starch components in an homogeneous state, *i.e.* to prevent the gluten from agglomerating. The suspension was then sent to an Alfa =Laval centrifugal decanter, operating at 2000 rpm rotary speed, and the overflow (protein-rich fraction) and the underflow (starch fraction) were collected (Example 1, Column 6, Lines 33 to 50, in particular). There is no discussion of shear, cavitation, and impact. A centrifugal decanter, to one of skill in the art, would not infer or imply a device which imparts shear, cavitation, and impact to achieve the result of deagglomerization of the starch-protein agglomerates with minimal starch damage and the homogeneous dispersion of individual starch granules and protein in a liquid matrix. Thus, Walon does not anticipate the claimed invention.

6. Kampen (U. S. Patent 5,410,021, Apr 25 1995) describes the process of mechanically breaking protein starch down by wet attrition milling. The grain particles, specifically corn, are milled to particle size sufficiently small to break the bond between starch and protein and sufficiently large to retain substantially all of the starch granules

intact. The protein is then extracted with ethanol and alkali solvents, separated and dried to form protein and/or protein isolate. The intact starch granules are cleaned and dried. The attrition mill described in the patent consists of two carborundum disks with one rotating at a high speed and the other stationary. The particle size reduction is limited to the clearance between the disks; therefore, once the clearance is set at more than the particle size of the largest granule, separation of smaller granules still imbedded in the protein matrix will not take place. The process relies on chemical extraction of protein to produce intact starch granules. Therefore, deagglomerization of the starch-protein agglomerates with minimal starch damage and the homogeneous dispersion of individual starch granules and protein in a liquid matrix does not occur. Thus, Kampen does not anticipate the claimed invention.

7. Bartsch *et al.* (DE 4428933) teach a process comprising comminuting rice under wet or dry conditions, loosening the matrix by soaking **without** application of pressure, and centrifuging the slurry. Their process was improved by carrying out the soaking step at pH $\leq$9, adding enzymes before or during soaking, and homogenizing the slurry during or after soaking by application of shearing forces. Bartsch *et al.* (DE 4428933) disclose that the homogenization in accordance with the invention takes place under indeterminate pressure conditions by means of ultrasound, a colloidal mill, a microcavitation disintegration apparatus, or a procedure involving screening combined with a displacement pump (Description: Page 2, Lines 5-6). In the claims, Bartsch *et al.* (DE 4428933) recite homogenization by means of ultrasound (Claim 6), a colloidal mill (Claim 7), high pressure (Claim 8), a microcavitation disintegration machine (Claim 9), and through a combination of screening and a displacement pump (Claim 10). Thus, the homogenization conditions are recited separately in the claims. Bartsch *et al.* (DE 4428933) do not disclose, teach, exemplify, or recite the amount or range of pressure utilized. There is no disclosure, teaching, exemplification, or recitation of a process whereby a slurry is subjected to all three conditions: shear, cavitation, and impact or that

the result is deagglomerization of the starch-protein agglomerates with minimal starch damage and the homogeneous dispersion of individual starch granules and protein in a liquid matrix. Thus, Bartsch *et al.* (DE 4428933) do not anticipate the claimed invention.

8. Meuser *et al.* (1985. New Approaches to Research on Cereal Carbohydrates, Hill *et al.*, Eds. Elsevier Science Publishers, Amsterdam, The Netherlands, pages 161-180) disclose that a steeping time of 12 hours at atmospheric pressure or 4 hrs at 218 psi, sometimes in the presence of SO_2, is required for corn and other grains and vegetables prior to high pressure (1450 psi) processing in the splitter head apparatus and that the distribution of particle sizes changes after multiple passes through the disintegration valve. The first passage through the disintegration valve results in most particles being concentrated in the 28-160 µm range, the second passage results in 8% of the fraction being particles >63 µm, and after the fourth passage, particles were observed to be at different stages of decomposition, ranging from intact particles to complete structural disintegration. They further teach that this technology using low pressure homogenization might not be suitable for the production of rice starches due to the small granule size and the different chemistry of the starch-protein matrix (Paragraph bridging Pages 3 and 4 of the instant specification). There is no disclosure, teaching, exemplification, or recitation of a process whereby a slurry is subjected to all three conditions: shear, cavitation, and impact or that the result is deagglomerization of the starch-protein agglomerates with minimal starch damage and the homogeneous dispersion of individual starch granules and protein in a liquid matrix. Thus, Meuser *et al.* do not anticipate the claimed invention.

In view of the above remarks, it is respectfully requested that the rejection of Claims 15-30 under 35 U.S.C. 102(b) be withdrawn.

CONCLUSION

In view of the above remarks, it is believed that all of the claims and the specification are in condition for allowance. Accordingly, it is respectfully requested that the rejections be withdrawn and that the instant application be allowed to issue. If any issues remain to be resolved, the Examiner is invited to telephone the undersigned at the number below.

Respectfully submitted,

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Date

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